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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte STEFFEN CLARENCE PAUWS

Appeal 2009-013133
Application 10/596,135
Technology Center 2100

Before MAHSHID D. SAADAT, ALLEN R. MacDONALD, and
ERIC S. FRAHM, *Administrative Patent Judges.*

FRAHM, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF CASE

Introduction

Appellant appeals under 35 U.S.C. § 134(a) from a final rejection of claims 1-20. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

Exemplary Claim

Exemplary independent claim 1 under appeal reads as follows:

1. A method comprising:

decomposing a query string that corresponds to an encoding of an audio fragment into a sequence of a plurality of query sub-strings;

independently searching a melody database for at least a respective closest match for each sub-string of the plurality of query sub-strings; and

in dependence on search results for the respective sub-strings, determining at least a closest match for the query string.

The Examiner's Rejections

(1) The Examiner rejected claim 11 under 35 U.S.C. § 101 as being directed to non-statutory subject matter, e.g., a computer media including transmission media such as a signal or carrier wave. Ans. 3 (citing Spec. 14:2-4). Appellant does not contest this rejection (*see* App. Br. 8 and 16; Reply Br. 1 and 10).

(2) The Examiner rejected claims 1-20 under 35 U.S.C. § 102(e) based upon the teachings of Tsui (US 2007/0163425 A1).[1] Ans. 4-8.

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[1] Appellant does not present separate patentability arguments for dependent claims 3, 4, 9, 14, and 15, and only provides specific arguments in the briefs with regard to (i) dependent claims 2, 5-8, 10, 13, and 16-20 (App. Br. 11-16; Reply Br. 6-10); and (ii) independent claims 1, 11, and 12, and relies on

Appellant's Contentions[2]

(1) With regard to the anticipation rejection of claims 1, 3, 4, 9, 11, 12, 14, and 15, Appellant contends, *inter alia* (App. Br. 8-10; Reply Br. 2-5) that Tsui fails to disclose (i) independently searching a melody database for at least a closest match for each sub-string of a plurality of query sub-strings, (ii) independently searching database 14 for each note of the query, (iii) determining a closest match for the query string based on the search results for the sub-strings, and (iv) sub-strings.

(2) With regard to the anticipation rejection of claims 2 and 13, Appellant contends (App. Br. 11; Reply Br. 6) that Tsui's paragraph [0042] fails to disclose decomposing a query string into sub-strings that each substantially correspond to a phrase of a melody.

(3) With regard to claims 5, 8, 16, and 17, Appellant contends (App. Br. 11-12) that Tsui's paragraph [0048] fails to disclose that a change in query input modality substantially coincides with a sub-string boundary as recited in claims 5 and 16. Appellant also contends (Reply Br. 6-7) that Tsui does not distinguish between different types of modalities in the

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the arguments as to claim 1 with regard to remaining claims 3, 4, 9, 14, and 15 (App. Br. 8-10; Reply Br. 2-5). We select claim 1 as representative of the group of claims 1, 3, 4, 9, 11, 12, 14, and 15 on appeal, pursuant to our authority under 37 C.F.R. § 41.37(c)(1)(vii). *See In re McDaniel*, 293 F.3d 1379, 1383 (Fed. Cir. 2002) ("If the brief fails to meet either requirement [of 37 CFR § 1.192(c)(7)], the Board is free to select a single claim from each group of claims subject to a common ground of rejection as representative of all claims in that group and to decide the appeal of that rejection based solely on the selected representative claim.").

[2] Because Appellant does not contest the merits of the rejection under 35 U.S.C. § 101 (*see* App. Br. 8 and 16; Reply Br. 1 and 10), we will sustain the § 101 rejection *pro forma*. *See* 37 C.F.R. § 41.37(c)(1)(vii).

identification of boundaries between notes, and Tsui fails to disclose a query with multiple input modalities.

(4) With regard to the anticipation rejection of claims 8 and 17, Appellant contends, *inter alia* (App. Br. 12; Reply Br. 7) that Tsui's paragraph [0104] fails to disclose detecting the change in query input modality based on a classification criteria of each input modality.

(5) With regard to the anticipation rejection of claims 6, 7, 10, and 18-20, Appellant contends, *inter alia* (Reply Br. 7-9) that Tsui fails to disclose centroids, minimizing distances between centroids, convergence, or minimizing a distance between centroids until a predetermined convergence criterion is met as recited. Appellant also contends (App. Br. 12-13) that Tsui fails to disclose estimating how many (Ns) sub-strings are present in the query string, and iteratively determining respective centroid values based on the sub-string as recited in claims 6 and 18. Appellant contends (App. Br. 14) that Tsui fails to disclose estimating how many sub-strings are present based on an average duration of a phase as recited in claims 7 and 19. Finally, Appellant contends (App. Br. 14-15) that Tsui fails to disclose generating a list of the N closest corresponding parts in the database for each sub-string with a corresponding measure of resemblance, and determining a closest match for the query string based on the measures of resemblance of the N-best lists of the sub-strings as recited in claims 10 and 20.

ISSUES

Based on Appellant's arguments, the following issues are presented:

(1) Did the Examiner err in rejecting claims 1, 3, 4, 9, 11, 12, 14, and 15 as being anticipated because Tsui fails to disclose the limitations at issue in representative claim 1?

(2) Did the Examiner err in rejecting claims 2, 5, 8, 13, 16, and 17 as being anticipated because Tsui fails to disclose the limitations at issue?

(3) Did the Examiner err in rejecting claims 6, 7, 10, and 18-20 as being anticipated because Tsui fails to disclose the limitations at issue?

ANALYSIS

We have reviewed the Examiner's rejections in light of Appellant's contentions in the Appeal Brief (App. Br. 8-16) and Reply Brief (Reply Br. 1-10) that the Examiner has erred.

We disagree with Appellant's conclusions regarding the first and second issues as to claims 1-5, 8, 9, and 11-17 (*see supra* Appellant's contentions (1)-(4)). With regard to claims 1-5, 8, 9, and 11-17, we adopt as our own (1) the findings and reasons set forth by the Examiner in the action from which this appeal is taken, and (2) the reasons set forth by the Examiner in the Examiner's Answer in response to Appellant's Appeal Brief (Ans. 4-13). We concur with the conclusions reached by the Examiner with regard to the rejection of claims 1-5, 8, 9, and 11-17 under § 102(e) as being anticipated by Tsui.

First Issue: Claims 1, 3, 4, 9, 11, 12, 14, and 15

We are not persuaded by Appellant's arguments as to representative claim 1 (*see* App. Br. 8-10; Reply Br. 2-5), that Tsui fails to disclose (i)

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independently searching a melody database for at least a closest match for each sub-string of a plurality of query sub-strings, (ii) independently searching database 14 for each note of the query, (iii) determining a closest match for the query string based on the search results for the sub-strings, and (iv) sub-strings.

Because Tsui discloses that "the melody is segmented into a series of frames" (¶ [0011], lines 6-7), and each frame contains a note of the melody (i.e., query string), Tsui's frames containing notes are is equivalent to the recited sub-strings. The notes or frames (i.e., sub-strings) are each associated with a breakpoint, therefore confidence levels are computed for each sub-string. We agree with the Examiner (Ans. 10-11) that Tsui discloses generating a matching score for the input melody which is composed of plural frames and notes (i.e., sub-strings), "taking into account the confidence levels of each identified breakpoint and each extracted note" (¶ [0085], lines 4-6). In addition, we are not persuaded by Appellant's argument that Tsui's notes or frames cannot be equivalent to the recited sub-strings, because Appellant admits that it was known in the prior art at the time of Appellant's invention that a hummed audio fragment can be converted "into a sequence of tones or tone differences" (Spec. 1:15-17).

Tsui searches song database 14 for "songs or pieces of music" (¶ [0044], line 3), computes confidence levels for each breakpoint (¶ [0050]), and calculates a matching score for each song or piece of music in the database 14 (¶ [0044], lines 20-21). Because the database 14 can be searched for "pieces of music" and not just a whole song (¶ [0044], line 3), Tsui discloses independently searching the database 14 for a closest match *for each sub-string*, as recited in representative claim 1.

For at least the foregoing reasons, we will sustain the Examiner's anticipation rejection of representative claim 1. For similar reasons, we will sustain the Examiner's anticipation rejection of claims 3, 4, and 9 which ultimately depend from claim 1 and were not separately argued. Also for similar reasons, we will sustain the Examiner's anticipation rejection of claims 11 and 12 which contain similar features as representative claim 1, as well as the Examiner's anticipation rejection of claims 14 and 15 which ultimately depend from claim 12 and were not separately argued.

Second Issue: Claims 2, 5, 8, 13, 16, and 17

We are not persuaded by Appellant's arguments as to claims 2 and 13, that Tsui's paragraph [0042] does not teach decomposing a query string into sub-strings that each substantially correspond to a phrase of a melody (*see* App. Br. 11; Reply Br. 6). Tsui discloses "spectral analysis techniques" which "are used find 'breakpoints' in the input melody in order to separate it into distinct notes" (¶ [0042], lines 4-7). Because "the melody is segmented into a series of frames" (¶ [0011], lines 6-7), each frame contains a note of the melody (i.e., query string) and is equivalent to the recited sub-strings. Tsui discloses segmenting a waveform representing a melody "into a series of frames, wherein adjacent breakpoints encompass one or more sequential frames, each note being defined between adjacent breakpoints" (¶ [0014], lines 4-7). By "computing a spectral energy distribution (SED) indicator for each frame," and determining pitch and energy level changes for each frame, Tsui creates a differential note and timing file 150 which is used for comparison with database 14 (¶ [0014], lines 8-9, ¶ [0042], lines 17-21; *see also* ¶ [0104]).

We are also not persuaded by Appellant's arguments as to claims 5, 8, 16, and 17, that (i) Tsui's paragraph [0048] fails to disclose that a change in query input modality substantially coincides with a sub-string boundary as recited in claims 5 and 16 (*see* App. Br. 11-12); and (ii) Tsui does not distinguish between different types of modalities in the identification of boundaries between notes, and fails to disclose a query with multiple input modalities (*see* Reply Br. 6-7). Tsui discloses that each frame or note (i.e., sub-string) is associated with a breakpoint (i.e., sub-string boundary) (*see* ¶¶ [0008], [0011], [0042], and [0048]). Tsui's disclosure of detecting changes in the input melody (i.e., query string) is equivalent to detecting changes in the query input modality that identifies sub-string boundaries (*see* ¶¶ [0042], [0048], [0051]-[0055], and [0104]). Furthermore, Tsui discloses some of the same input modalities as Appellant, such as singing and whistling (*compare* Tsui, ¶ [0041], line 9 *with* Spec. 1:19-20), and Tsui's detection of pitch period (¶ [0062]), changes in pitch (¶ [0054]), periods of silence (¶ [0053]), and changes in spectral energy distribution (¶ [0104]) serve to detect changes in the modality of the input melody (e.g., changes from tapping whistling to singing, or singing to humming, etc.).

And lastly, regarding claims 8 and 17, we are not persuaded by Appellant's arguments that Tsui's paragraph [0104] fails to disclose detecting the change in query input modality based on a *classification criteria* of each input modality (*see* App. Br. 12; Reply Br. 7). Paragraph [0104] discloses "determining breakpoints based on changes in the spectral energy distribution of the input melody" (¶ [0104], lines 2-3). Tsui's changes that are detected in the spectral energy distribution of the melody are equivalent to the "classification criteria" recited in claims 8 and 17.

In view of the foregoing, we will sustain the Examiner's anticipation rejection of claims 2, 5, 8, 13, 16, and 17.

Third Issue: Claims 6, 7, 10, and 18-20

We agree with Appellant's conclusions regarding the third issue as to claims 6, 7, 10, and 18-20 (*see supra* Appellant's contention (5)).

Tsui (*see* ¶¶ [0008], [0010], [0011], [0048], [0050], [0051], [0062], and [0067]) fails to disclose centroids, minimizing distances between centroids, convergence, or minimizing a distance between centroids until a predetermined convergence criterion is met as recited. We agree with Appellant that Tsui fails to disclose (i) estimating how many sub-strings are present in the query string, and iteratively determining respective centroid values based on the sub-string as recited in claims 6 and 18; (ii) estimating how many sub-strings are present based on an average duration of a phase as recited in claims 7 and 19; and (iii) generating a list of the N closest corresponding parts in the database for each sub-string with a corresponding measure of resemblance, and determining a closest match for the query string based on the measures of resemblance of the N-best lists of the sub-strings as recited in claims 10 and 20. Tsui's computing a spectral energy distribution (SED) for each frame (*see* ¶¶ [0011] and [0104]), determining pitch periods (*see* ¶ [0062]), and estimating the location of note breakpoints (*see* ¶ [0067] are not equivalent to the limitations recited in Appellant's claims 6, 7, 18, and 19.

In view of the foregoing, we will not sustain the Examiner's anticipation rejection of claims 6, 7, 10, and 18-20.

<div align="center">CONCLUSIONS</div>

(1) The Examiner has not erred in rejecting claim 11 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

(2) Tsui discloses the method, computer media, and system for performing the method as set forth in claims 1, 2, 5, 8, 13, 16, and 17. Tsui fails to disclose the method and system for performing the method as set forth in claims 6, 7, 10, and 18-20.

(3) The Examiner did not err in rejecting claims 1-5, 8, 9, and 11-17 as being unpatentable under 35 U.S.C. § 103(a).

(4) Claims 1-5, 8, 9, and 11-17 are not patentable.

<div align="center">DECISION[3]</div>

The decision of the Examiner rejecting claim 11 under 35 U.S.C. § 101 as being directed to non-statutory subject matter is affirmed, *pro forma*.

The decision of the Examiner rejecting claims 1-5, 8, 9, and 11-17 under 35 U.S.C. § 102(e) is affirmed.

The decision of the Examiner rejecting claims 6, 7, 10, and 18-20 under 35 U.S.C. § 102(e) is reversed.

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[3] We have decided the appeal before us. However, should there be further prosecution of claims 1-10, the Examiner's attention is directed to recently issued guidance from the Director and our reviewing courts. *See, e.g.*, *Interim Guidance for Determining Subject Matter Eligibility for Process Claims in View of Bilski v. Kappos*, 75 Fed. Reg. 43922, 43922-28 (Jul. 27, 2010); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1371 (Fed. Cir. 2011) (holding that a method that can be performed by human thought alone is merely an abstract idea and is not patent-eligible under § 101); *Bilski v. Kappos*, 130 S. Ct. 3218 (2010).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

<u>AFFIRMED-IN-PART</u>

msc